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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,017	02/18/2004	Terence Edwin Dodgson	678-1368	2840

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EXAMINER	
CHANG, LI WU	

ART UNIT	PAPER NUMBER
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/781,017	DODGSON, TERENCE EDWIN	
	Examiner	Art Unit	
	LIWU CHANG	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/04/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-11 are pending.

Specification

2. The title of the invention, "neural network", is not descriptive and too broad. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu ("ATM Communications Network Control by Neural Networks", IEEE Trans. On Neural Networks, Vol. 1, No. 1, 1990), hereinafter Hiramatsu, in view of Lo (US Patent Number 5748847), and hereinafter Lo.**

4. With respect to claim 1, Hiramatsu discloses a data processing device for processing time-varying signals, comprising:

computing means for performing a plurality of neuron computations, to provide at least two layers of said neuron computations each comprising at least two parallel said neuron computations, the outputs of one such layer being fed forward to another (**Hiramatsu:** pg 123, sec II-B, par 2, "… the training of many neural networks interconnected to each other …" and examples in sec III imply multiple-layered neural networks, connections, parallel computation and outputs being fed forward to another);

each said neuron computation comprising receiving a plurality of input signals, weighting each signal according to a predetermined weight value, and generating an output signal comprising a function of the weighted input signals (**Hiramatsu:** pg 124, sec III-B, par 2, "… a 3-layer fully connected neural network … Input signals … cell arrival rate, cell loss rate …" and "Output signals …" with sec IV, A-2-a, "… the initial weights …"); and

output means for generating at least one output signal from said computing means, the or each output signal comprising a

function of the or each input signal (**Hiramatsu:** pg 124, sec III-B, par 2, "Output signals are … such as predicted values of cell arrival rate and cell loss rate …");

characterised by:

cyclical control signals associated with said neuron computations to indicate parts of a time cycle during which some of said neuron computations are inoperative (**Hiramatsu:** pg 123, sec II-A, par 3, the "control cycle" imply a acyclic control, and "… three control levels by the control cycle" imply some of neuron computations are inoperable, wherein different control phases are shown in Fig 2 and/or in III-C-3, pars 2-3);

time control means for applying said cyclical control signals to said neuron computations during operation of said computing means on said time-varying signals (**Hiramatsu:** sec II and Fig 2 describe the time control by NN with signals, including rate and burst, as in Table 1).

Hiramatsu discloses various traffic signals (**Hiramatsu:** Table 1, "traffic"), but does not expressly disclose "time-varying signals". Lo discloses input means for receiving a said time-varying signal (**Lo:** Col 23, L 17-20, "… time-varying parameters and/or coefficients of the plant can be included in the vector x(t) …", where "x(t)" is the input vector).

Processing of time-varying signals is a common technique in neural networks (e.g., radial basis function). It would have been obvious for one of ordinary skill in the art at the time of invention to include the time-varying signals, as taught by Lo, into the multiple NN control framework of Hiramatsu, because ATM involves handling various traffic patterns.

5. With respect to claim 2, Lo discloses at least one serial to parallel convertor associated with each said neuron computation so as to provide a plurality of parallel inputs to the neuron computation comprising differently-delayed versions of the same signal (**Lo:** Col 2, L 42-45, "… series-parallel formulation …", and Fig 3, for instance, shows the time delays).

6. With respect to claim 3, Hiramatsu discloses gating arrangement being controllable by a predetermined and updatable control word to specify which of the parallel outputs of the convertor comprise said plurality of parallel inputs to the neuron computation (**Hiramatsu:** each operation, e.g., sec II-B, a learning control method for admission control, defines a control word, and a control word specify a parallel inputs, e.g., III-B, par 2, L 10-12, "parallel format", wherein learning of neural network implies control words are updatable).

Lo discloses a gating arrangement associated with each said serial to parallel convertor (**Lo:** Col 2, L 39-43, "A problem of adaptive system identification is to design and implement a processor and an adaptor, that operate in the operating environment represented by the equations, (1), (2) and (3)", and Figs 3-16, imply gating arrangement).

7. With respect to claim 4, Lo discloses comprising a programmable signal processing device programmed to perform said plurality of neuron computations on a signal (**Lo:** Col 3, L 1-6, "… adaptive processing and its application …" and citation of relevant arts in signal processing).

8. With respect to claim 5, Hiramatsu discloses including an integrated circuit comprising a plurality of neuron computation devices operating to perform said neuron computations in parallel (**Hiramatsu:** the ATM system and communication devices imply IC, and sec II-B, par 2, "… many neural networks …" and "… optimal link assignment" imply computations in parallel).

9. With respect to claim 6, Hiramatsu discloses a communications terminal device operable to communicate selectively over a communications channel in a plurality of

different communications modes, comprising a data processing device for processing time-varying signals (**Hiramatsu:** Fig 2), said data processing device comprising:

computing means for performing a plurality of neuron computations, to provide at least two layers of said neuron computations each comprising at least two parallel said neuron computations, the outputs of one such layer being fed forward to another (**Hiramatsu:** pg 123, sec II-B, par 2, "… the training of many neural networks interconnected to each other …" and examples in sec III imply multiple-layered neural networks, connections, parallel computation and outputs being fed forward to another);

each said neuron computation comprising receiving a plurality of input signals, weighting each signal according to a predetermined weight value, and generating an output signal comprising a function of the weighted input signals (**Hiramatsu:** pg 124, sec III-B, par 2, "… a 3-layer fully connected neural network … Input signals … cell arrival rate, cell loss rate …" and "Output signals …" with sec IV, A-2-a, "… the initial weights …"); and

output means for generating at least one output signal from said computing means, the or each output signal comprising a function of the or each input signal (**Hiramatsu:** pg 124, sec

III-B, par 2, "Output signals are … such as predicted values of cell arrival rate and cell loss rate …"); and

a neuron updating circuit arranged to supply different parameter values for use in said neuron computations, so as to change the communications mode from one said predetermined mode to another (**Hiramatsu:** pg 124, sec III-B, par 2, "cell arrival rate, cell loss rate, …" imply different parameter values, and pg 123, sec II-A, par 3, "three control levels by the control cycle" imply to change the communication modes).

Hiramatsu discloses various traffic signals (**Hiramatsu:** Table 1, "traffic"), but does not expressly disclose "time-varying signals". Lo discloses input means for receiving a said time-varying signal (**Lo:** Col 23, L 17-20, "… time-varying parameters and/or coefficients of the plant can be included in the vector x(t) …", where "x(t)" is the input vector).

Processing of time-varying signal is a common technique in neural networks (e.g., radial basis function). It would have been obvious for one of ordinary skill in the art at the time of invention to include the time-varying signals, as taught by Lo, into the multiple NN control framework of Hiramatsu, because ATM involves handling various traffic patterns.

10. With respect to claim 7, Lo discloses in which the data processing device is according to claim 1 (**Lo:** the data processing device processing "… time-varying parameters …", Col 23, L 17-20).

11. With respect to claim 8, Hiramatsu discloses a device operable to add a new communications mode by receiving new said parameter values via said communications channel (**Hiramatsu:** pg 123, sec II-A, par 3, "… adaptability to changes in the offered traffic characteristics and to additional requests for new services is required for control", wherein "new services" imply to add a new communications mode, and the "traffic characteristics" imply receiving new parameter values via communication channel).

12. With respect to claim 9, Hiramatsu discloses the station comprising means for transmitting a signal comprising new parameter values for neural computations, to add a new communications mode to said device (**Hiramatsu:** Fig 2, indicates a terminal, and pg 123, sec II-A, par 3, "new services" imply to add a new communications mode to said device, and the "traffic characteristics" imply transmitting signals comprising new parameter values as input for computations).

13. **Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahadiroglu (US Pub. No. 2002/0186660 A1), hereinafter Bahadiroglu, and in view of Hiramatsu.**

14. With respect to claim 10, Bahadiroglu discloses a communications system comprising a plurality of terminals each having a neural network therein (**Bahadiroglu:** Abstract, L 12-18, "Network conditions may be determined by transmission of monitor or data packets and may be determined at either or both of the sending or receiving nodes and the optimum packet size and inter-packet interval are determined by … a neural network analyzer …).

Bahadiroglu does not disclose "which has parameter values enabling the network to emulate a transmission processing stage in a transmission mode, and a transmission station for sending new parameter values to the terminals to change the operation of the neural networks to emulate a new transmission mode".

Hiramatsu discloses a neural network which has parameter values enabling the network to emulate a transmission processing stage in a transmission mode (**Hiramatsu:** pg 123, sec III-B, par 2, "Input signals to the neural network will be … cell arrival rate, cell loss rate, cell generation rate … and call set-up

request … past observed status" and "Output signals are the predicted service quality …" imply parameter values enabling the network to emulate a transmission processing stage in a transmission mode), and a transmission station for sending new parameter values to the terminals to change the operation of the neural networks to emulate a new transmission mode (**Hiramatsu:** pg 123, sec II-A, par 3, "adaptability to changes in the offered traffic characteristics and to additional requests for new services is required for control" imply adding new transmission modes, and pg 123, sec II-B, par 2, "a learning control method using neural networks could realize a controller which automatically adapts to a new situations" imply new parameters values are sent to change the operation of the neural networks).

It would have been obvious for one of ordinary skill of the art at the time of invention to combine the teachings of Hiramatsu with the teachings of Bahadiroglu by including the multiple neural nets control over communication networks, as taught by Hiramatsu, in order to enhance the data transmission to meet predetermined data rate requirements and network conditions.

15. With respect to claim 11, Bahadiroglu discloses a method of operating a communications system comprising a plurality of

terminals, each terminal including a feed-forward computation network (**Bahadiroglu:** Abstract, L 12-18, "Network conditions may be determined by transmission of monitor or data packets and may be determined at either or both of the sending or receiving nodes and the optimum packet size and inter-packet interval are determined by … a neural network analyzer …).

Bahadiroglu does not disclose "operating in accordance with a plurality of network parameter values" and "comprising adding a new transmission mode by sending new network parameter values to the terminals".

Hiramatsu discloses "operating in accordance with a plurality of network parameter values" (**Hiramatsu:** Figs 2-3 and sec II-B, par 2, "… prediction of service quality from observed traffic and choice of the optimal control values" networks …" imply operating in accordance with a plurality of network parameter values), comprising adding a new transmission mode by sending new network parameter values to the terminals (**Hiramatsu:** pg 124, sec III-B, par 2, "cell arrival rate, cell loss rate, …" imply different parameter values are sent to the terminals, and pg 123, sec II-A, par 3, "adaptability to changes in the offered traffic characteristics and to additional requests for new services is required for control" imply adding new transmission modes).

It would have been obvious for one of ordinary skill of the art at the time of invention to combine the teachings of Hiramatsu with the teachings of Bahadiroglu by including the multiple neural nets control over communication networks, as taught by Hiramatsu, in order to enhance the data transmission to meet predetermined data rate requirements and network conditions.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIWU CHANG whose telephone number is 571-270-3809. The examiner can normally be reached on 8:30AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. C./ August 8, 2008

Examiner, Art Unit 2129

/Joseph P. Hirl/

Primary Examiner, Art Unit 2129